WHAT IS CLAIMED IS:

1. A chemical compound, comprising:

an electron donor group;

an electron acceptor group; and

a conjugated bridging element, said electron donor group and said electron acceptor group linked to each other via said conjugated bridging element,

wherein said chemical compound has a readily displaceable electron, a dipole character is present only in the excited state, and said chemical compound is capable of emitting photoluminescent radiation.

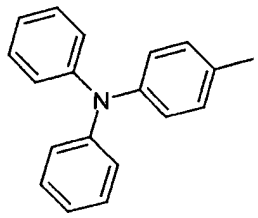
2. The compound according to claim 1, wherein the electron donor group is an aromatic amine or a fused cyclic system.

3. The compound according to claim 1, wherein the electron donor group is selected from the group consisting of triphenylamine, phenylenediamine and benzidine.

4. The compound according to claim 1, wherein the electron donor group is selected from the group consisting of carbazole, thiophene, and oligomers thereof.

5. The compound according to claim 1, wherein the electron donor group is selected from the group consisting of compounds of formulas 1a through 1d, thiophene, and oligomers thereof:

[Formula 1a]



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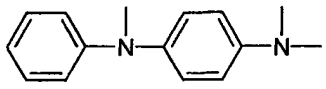
[Formula 1b]



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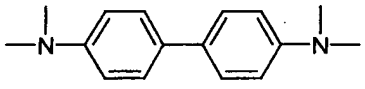
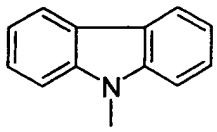
[Formula 1c]



, and

[Formula 1d]



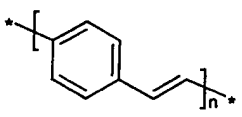
6. The compound according to claim 1, wherein the conjugated bridging element has a π-conjugated carbon bond.

7. The compound according to claim 6, wherein the π-conjugated carbon bond is included in an organic polymer with a chemical basic structure selected from the group consisting of a phenylenevinylene moiety in the form of a monomer, an oligomer, a polymer and a substituted product thereof, a phenylene moiety in the form of a monomer, an oligomer, a polymer and a substituted product thereof, a fluorene moiety in the form of a monomer, an oligomer, a polymer and a substituted product thereof, a vinylene moiety in the form of a monomer, an oligomer, a polymer and a substituted product thereof, a ethinylene moiety in the form of a monomer, an oligomer, a polymer and a substituted product thereof, an anthranylene moiety in the form of a monomer, an oligomer, a polymer and a substituted

product thereof, a naphthylene moiety in the form of a monomer, an oligomer, a polymer and a substituted product thereof.

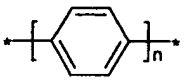
8. The compound according to claim 6, wherein the conjugated bridging element is selected from the group consisting of formulas 2a through 2g:

[Formula 2a]



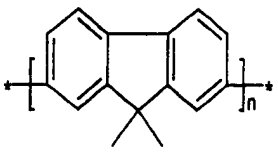
wherein n is a number ranging from 1 to 20,

[Formula 2b]



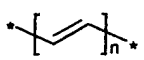
wherein n is a number ranging from 1 to 20,

[Formula 2c]



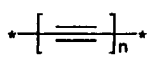
wherein n is a number ranging from 1 to 20,

[Formula 2d]



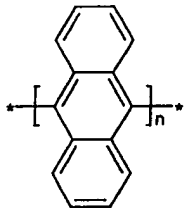
wherein n is a number ranging from 1 to 20,

[Formula 2e]



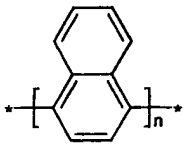
wherein n is a number ranging from 1 to 20,

[Formula 2f]



wherein n is a number ranging from 1 to 20, and

[Formula 2g]



wherein n is a number ranging from 1 to 20.

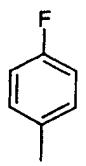
9. The compound according to claim 1, wherein the electron acceptor group is

selected from the group consisting of monosubstituted phenyl, disubstituted phenyl, trisubstituted phenyl, imide and anhydride of aromatic polycarboxylic acid, oxazole, and a fused cyclic system.

10. The compound according to claim 9, wherein the electron acceptor group has a chemical basic structure selected from the group consisting of a fluorine-substituted phenyl group, a nitro-substituted phenyl group, a cyano-substituted phenyl group, imide and anhydride of perylenetetracarboxylic acid and a substituted compound thereof, imide and anhydride of naphthalenetetracarboxylic acid and a substituted compound thereof, oxadiazole and a substituted compound thereof, oxazole and a substituted compound thereof, and a fluorenylidene moiety and a substituted compound thereof.

11. The compound according to claim 9, wherein the electron acceptor group is selected from the group consisting of the following compounds of formulas 3a through 3m:

[Formula 3a] [Formula 3b] [Formula 3c]



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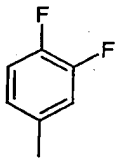

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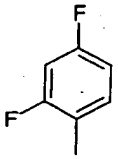
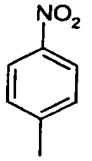


,

[Formula 3d] [Formula 3e]



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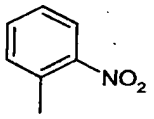

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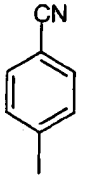
[Formula 3f] [Formula 3g] [Formula 3h]



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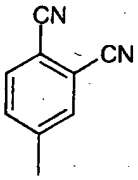

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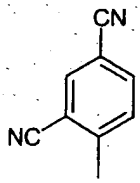
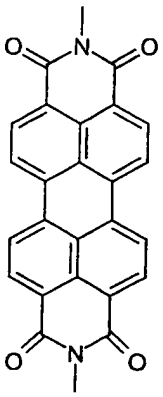


,

[Formula 3i]



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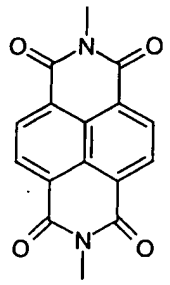
[Formula 3j]



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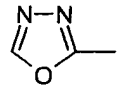
[Formula 3k]



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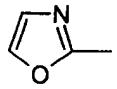
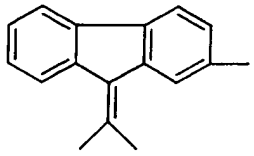
[Formula 3l]



, and

[Formula 3m]



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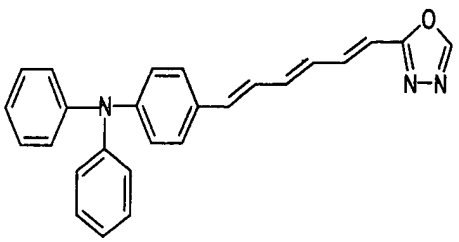
12. The compound according to claim 1, wherein the compound is selected from the group consisting of the following compounds of formulas 4a through 4c:

[Formula 4a]



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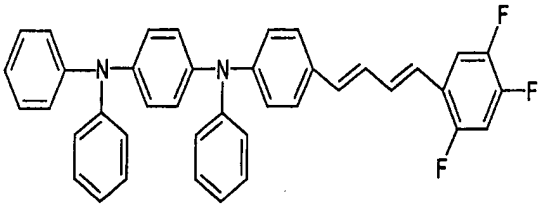
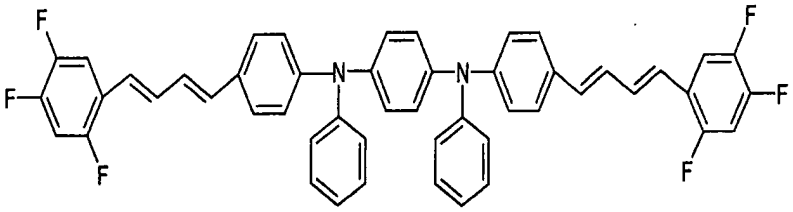
[Formula 4b]



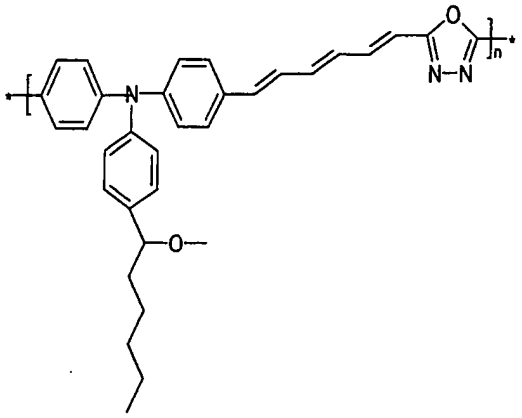
, and

[Formula 4c]



13. The compound according to claim 1, wherein the compound is selected from the group consisting of the following compounds of formula 5a through 5c:

[Formula 5a]



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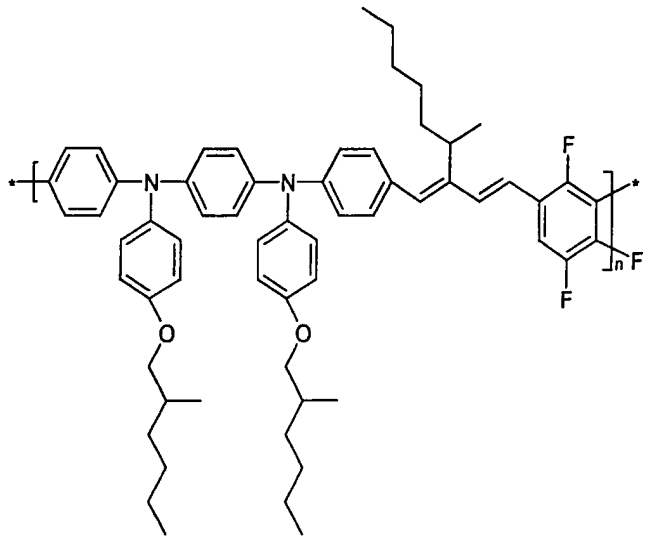
5 wherein n is a number ranging from 100 to 2,000,

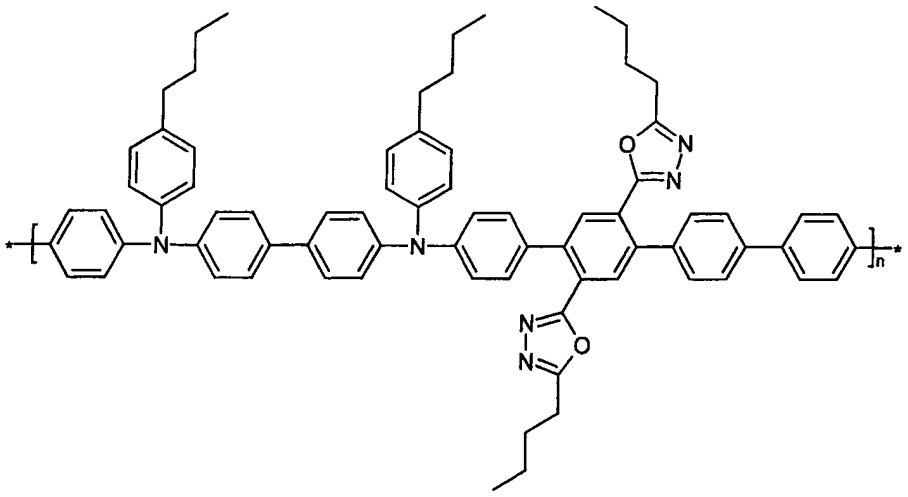
6 [Formula 5b]



7

8 wherein n is a number ranging from 100 to 2,000, and

9 [Formula 5c]



wherein n is a number ranging from 100 to 2,000.

14. The compound according to claim 1, wherein the electron donor group is an aromatic amine or a fused cyclic system, the conjugated bridging element has a π-conjugated carbon bond, and the electron acceptor group is selected from the group consisting of monosubstituted phenyl, disubstituted phenyl, trisubstituted phenyl, imide and anhydride of aromatic polycarboxylic acid, oxazole, and a fused cyclic system.

15 The compound according to claim 14, wherein said conjugated bridging element is a polymer having a main chain and a branched or side chain having an alkyl group or an alkoxy group.

16. A photoluminescence quenching device, comprising the chemical compound of claim 1.

17. The photoluminescence quenching device according to claim 16, wherein an required electric filed to quench half of photoluminescent radiation emitted without an electric field is less than 1.5×10^{8} V/m.

18. The photoluminescence quenching device according to claim 16, comprising:

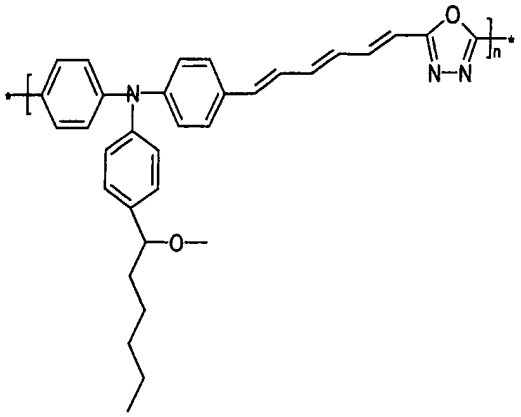
a glass substrate;

a layer of conductive transparent indium-tin oxide (ITO) on said glass substrate;

a layer of poly(ethylenedioxythiophene)/polystyrenesulfonic acid conductive polymer with a layer thickness of from 30 to 100 nm on said layer of conductive transparent indium-tin-oxide;

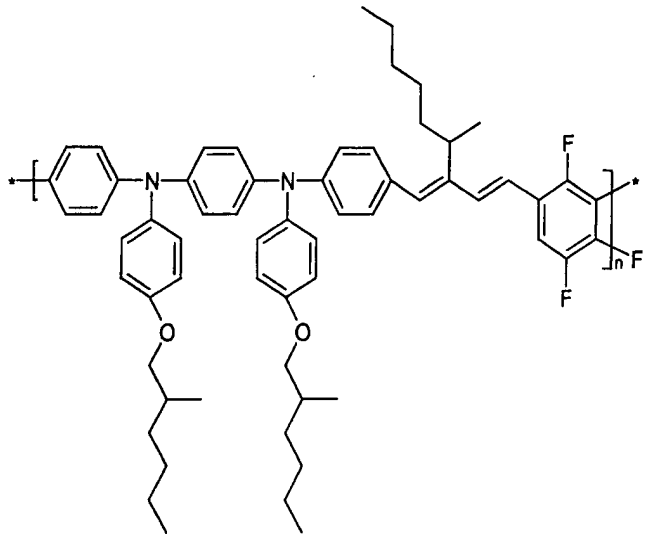
an emitter polymer layer having a thickness of from 50 to 150 nm, said emitter polymer layer having a material selected from the group consisting of the following compounds of formula 5a through 5c:

[Formula 5a]



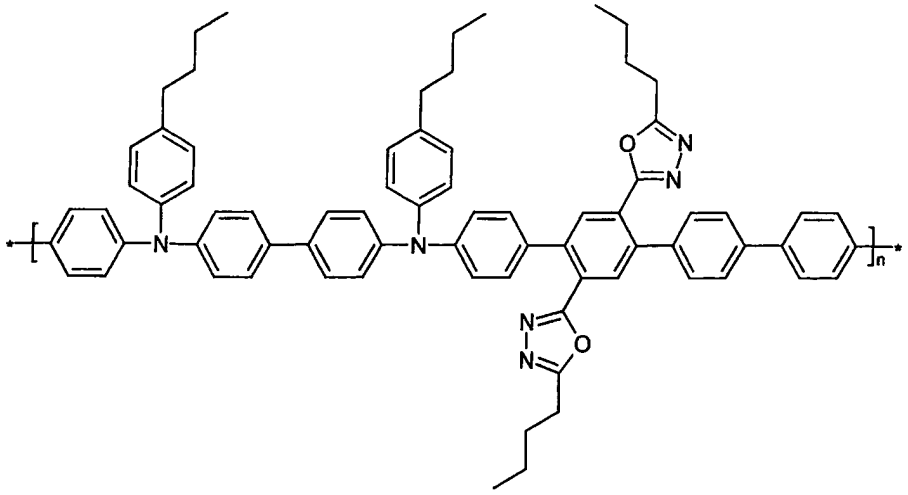
wherein n is a number ranging from 100 to 2,000,

[Formula 5b]



wherein n is a number ranging from 100 to 2,000, and

[Formula 5c]



wherein n is a number ranging from 100 to 2,000;

a metal contact; and

an aluminum layer with a layer thickness of from 50 to 200 nm.

19. The photoluminescence quenching device according to claim 18, further comprising an insulating film between the metal contact and the aluminum layer.

20. The photoluminescence quenching device according to claim 18, wherein more than half of photoluminescent radiation is suppressed when applying a voltage of 15 volts.